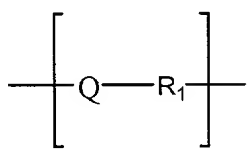
CLAIMS

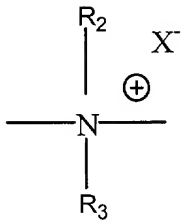
What is claimed is:

1. A method of treating mucositis in a mammal comprising administering to said mammal an effective amount of an ionene polymer.

2. A method of treating mucositis in a mammal comprising administering to said mammal an effective amount of an ionene polymer characterized by a repeat unit having the formula:



wherein R_1 is a substituted or unsubstituted hydrocarbyl group; and each Q is independently:



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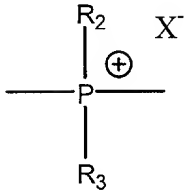

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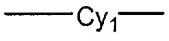

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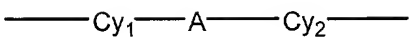

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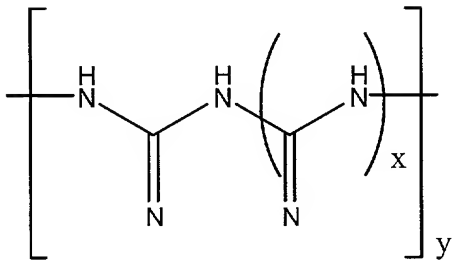

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wherein Cy_1 and Cy_2 are each independently a quaternary nitrogen-containing monocyclic heteroaromatic ring or non-aromatic heterocyclic ring, A is a covalent bond, or a substituted or unsubstituted lower alkylene group, and R_2 and R_3 are independently a substituted or unsubstituted aliphatic or aromatic group; each X^-, separately or taken together with other X^-s, is a physiologically acceptable anion; x is an integer from 0-4; and y is an integer from 1-5.

3. The method of Claim 2, wherein said ionene polymer is administered therapeutically.

4. The method of Claim 2, wherein said ionene polymer is administered prophylactically.

5. The method of Claim 2, wherein R_1 is a substituted or unsubstituted arylene or lower alkylene group.

6. The method of Claim 2, wherein said mucositis is oral mucositis.

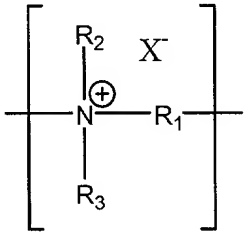
7. The method of Claim 6, wherein said oral mucositis is a side effect of anti-cancer therapy.

8. The method of Claim 7, wherein said anti-cancer therapy is chemotherapy or radiation therapy.

9. The method of Claim 6, wherein said oral mucositis is a side effect of bone marrow transplantation or stem cell transplant or ablation.

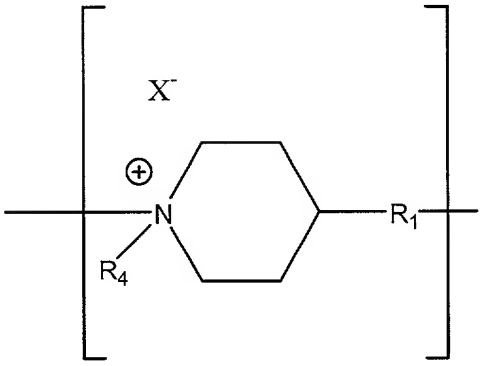
10. The method of Claim 6, wherein each R_2 and R_3 are each independently an alkyl group or a hydroxyalkyl group.

11. The method of Claim 6, wherein said repeat unit has the formula:



12. The method of Claim 11, wherein R_1 is a substituted or unsubstituted straight chained lower alkylene group or polyalkylene glycol optionally substituted with one or more –OH groups.

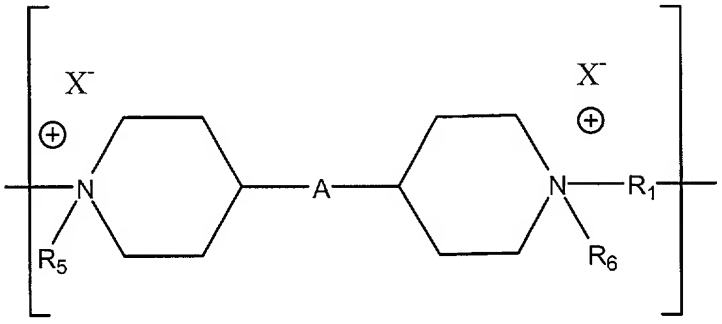
13. The method of Claim 6, wherein said repeat unit has the formula:



wherein R_4 is hydrogen or a substituted or unsubstituted lower alkyl group.

14. The method of Claim 13, wherein R_4 is a lower alkyl or hydroxy substituted lower alkyl.

15. The method of Claim 6, wherein said repeat unit has the formula:



wherein A is a bond or substituted or unsubstituted lower alkylene group, and wherein R_5 and R_6 are each independently hydrogen or a substituted or unsubstituted lower alkyl group.

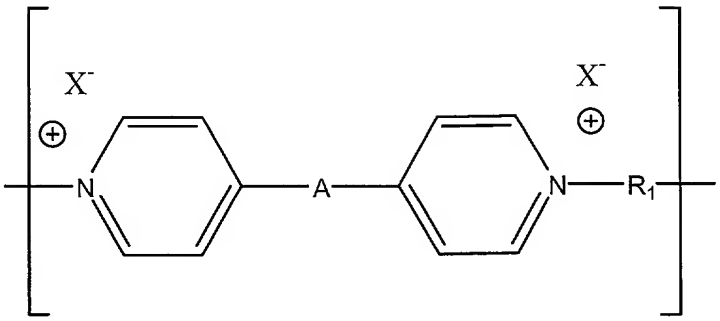
16. The method of Claim 15, wherein R_5 and R_6 are each independently an alkyl group or a hydroxyalkyl group.

17. The method of Claim 16, wherein A is an unsubstituted straight chained lower alkylene group.

18. The method of Claim 17, wherein R_1 is a substituted or unsubstituted straight chained lower alkylene group or polyalkylene glycol optionally substituted with one or more –OH groups.

19. The method of Claim 18, wherein R_1 is an unsubstituted polyalkylene glycol or $-CH_2CHOH(CH_2)_nCHOHCH_2-$ wherein n is an integer from 0 to 8.

20. The method of Claim 6, wherein said repeat unit has the formula:



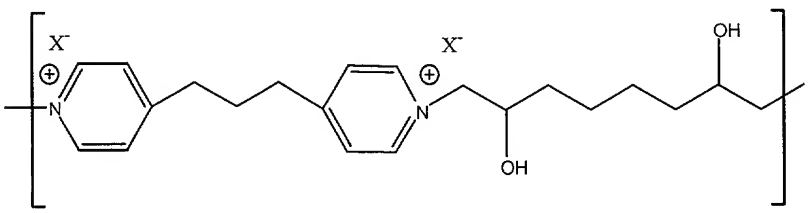
wherein A is a bond or substituted or unsubstituted lower alkylene group.

21. The method of Claim 20, wherein A is an unsubstituted straight chained lower alkylene group.

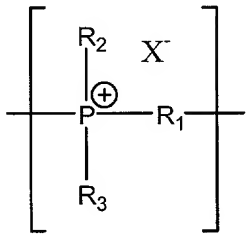
22. The method of Claim 21, wherein R_1 is a substituted or unsubstituted straight chained lower alkylene group or polyalkylene glycol optionally substituted with one or more –OH groups.

23. The method of Claim 22, wherein R_1 is an unsubstituted polyalkylene glycol or $-CH_2CHOH(CH_2)_nCHOHCH_2-$ wherein n is an integer from 0 to 8.

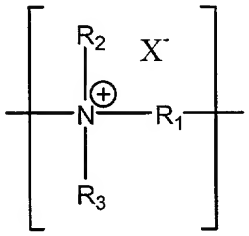
24. The method of Claim 23, wherein said repeat unit has the formula:



25. A method of treating mucositis in a mammal, comprising administering to said mammal an effective amount of an ionene copolymer characterized by a repeat unit of the formula:



and a repeat unit of the formula:



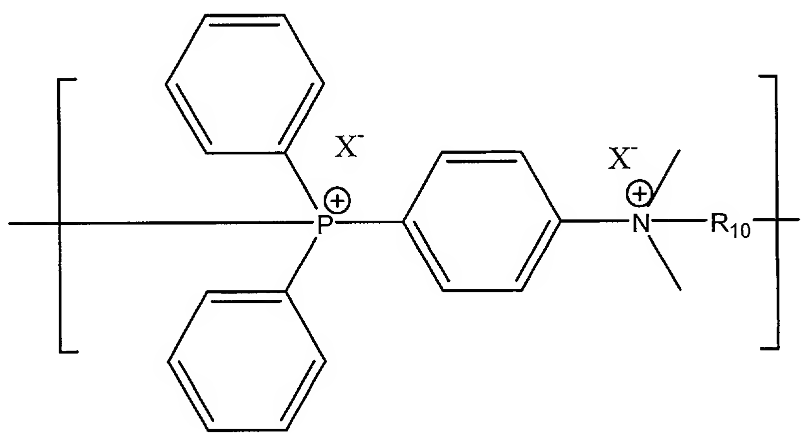
wherein R_1 is a substituted or unsubstituted hydrocarbyl group; R_2 and R_3 are independently a substituted or unsubstituted aliphatic or aromatic group; and each X^- in the polymer or copolymer, separately or taken together with other X^-s, is a physiologically acceptable anion.

26. The method of Claim 25, wherein said mucositis is oral mucositis.

27. The method of Claim 26, wherein said oral mucositis is a side-effect of anti-cancer therapy.

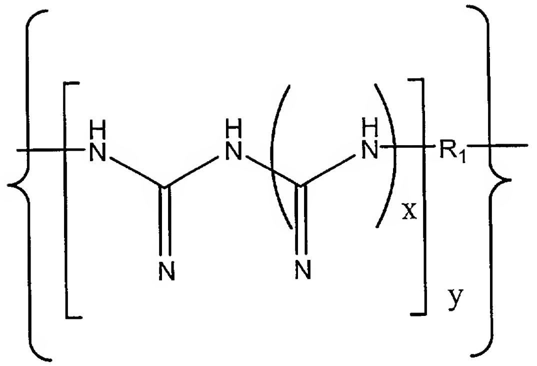
28. The method of Claim 27, wherein the anti-cancer therapy is chemotherapy or radiation therapy.

29. The method of Claim 25, wherein said polymer or copolymer is comprised of repeat units of the formula:

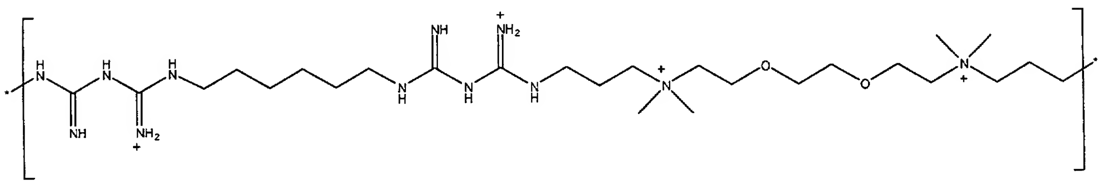


wherein R_{10} is a substituted or unsubstituted lower alkylene group having from about 4 to about 12 carbon atoms and each X^-, separately or taken together with other X^-s is a physiologically acceptable anion.

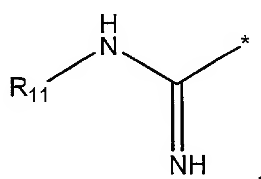
30. The method of Claim 6, wherein said polymer is characterized by repeat units of the formula:



31. The method of Claim 30, wherein said copolymer is characterized by the formula:



32. The method of Claim 30, wherein one or both end of the polymer or copolymer is capped with a group represented by the formula:



wherein R_{11} is a C2-C90 alkyl, C2-C90 oxyalkyl, or aromatic group and the symbol "*" represents the bond connecting the cap to the polymer or copolymer.